5. BIOLOGICAL BUFFERS

Table 1 This table of frequently used buffers gives the pK_a value at 25°C and the useful pH range of each buffer. The buffers are listed in order of increasing pH

Acronym	Name	Mol. wt.	pK_a	Useful pH range
MES	2-(*N*-Morpholino)ethanesulphonic acid	195.2	6.1	5.5–6.7
BIS TRIS	*Bis*(2-hydroxyethyl)iminotris(hydroxymethyl)methane	209.2	6.5	5.8–7.2
ADA	*N*-(2-Acetamido)-2-iminodiacetic acid	190.2	6.6	6.0–7.2
ACES	2-[(2-Amino-2-oxoethyl)amino]ethanesulphonic acid	182.2	6.8	6.1–7.5
PIPES	Piperazine-*N*,*N*′-*bis*(2-ethanesulphonic acid)	302.4	6.8	6.1–7.5
MOPSO	3-(*N*-Morpholino)-2-hydroxypropanesulphonic acid	225.3	6.9	6.2–7.6
BIS TRIS PROPANE	1,3-*Bis*[*tris*(hydroxymethyl)methylamino]propane	282.3	6.8[a]	6.3–9.5
BES	*N*,*N*-*Bis*(2-hydroxyethyl)-2-aminoethanesulphonic acid	213.2	7.1	6.4–7.8
MOPS	3-(*N*-Morpholino)propanesulphonic acid	209.3	7.2	6.5–7.9
HEPES	*N*-(2-Hydroxyethyl)piperazine-*N*′-(2-ethanesulphonic acid)	238.3	7.5	6.8–8.2
TES	*N*-*Tris*(hydroxymethyl)methyl-2-aminoethanesulphonic acid	229.2	7.5	6.8–8.2
DIPSO	3-[*N*,*N*-*Bis*(2-hydroxyethyl)amino]-2-hydroxypropanesulphonic acid	243.3	7.6	7.0–8.2
TAPSO	3-[*N*-*Tris*(hydroxymethyl)methylamino)-2-hydroxypropanesulphonic acid	259.3	7.6	7.0–8.2
TRIZMA	Tris(hydroxymethyl)aminomethane			
HEPPSO	*N*-(2-hydroxyethyl)piperazine-*N*′-(2-hydroxypropanesulphonic acid)	121.1	8.1	7.0–9.1
POPSO	Piperazine-*N*,*N*′-*bis*(2-hydroxypropanesulphonic acid)	268.3	7.8	7.1–8.5
EPPS	N-(2-Hydroxyethyl)piperazine-*N*′-(3-propanesulphonic acid)	362.4	7.8	7.2–8.5
TEA	Triethanolamine	252.3	8.0	7.3–8.7
TRICINE	*N*-*Tris*(hydroxymethyl)methylglycine	149.2	7.8	7.3–8.3
BICINE	*N*,*N*-*Bis*(2-hydroxyethyl)glycine	179.2	8.1	7.4–8.8
TAPS	*N*-*Tris*(hydroxymethyl)methyl-3-aminopropanesulphonic acid	163.2	8.3	7.6–9.0
AMPSO	3-[(1,1-Dimethyl-2-hydroxyethyl)amino]-2-hydroxypropanesulphonic acid	243.3	8.4	7.7–9.1
		227.3	9.0	8.3–9.7
CHES	2-(*N*-Cyclohexylamino)ethanesulphonic acid	207.3	9.3	8.6–10.0
CAPSO	3-(Cyclohexylamino)-2-hydroxy-1-propanesulphonic acid	237.3	9.6	8.9–10.3
AMP	2-Amino-2-methyl-1-propanol	89.1	9.7	9.0–10.5
CAPS	3-(Cyclohexylamino)-1-propanesulphonic acid	221.3	10.4	9.7–11.1

[a] $pK_a = 9.0$ for the second dissociation stage.
The table is reprinted with permission of Sigma Chemical Company, St. Louis, Mo.

DropBooks

6A. CLASSIFICATION AND CHARACTERIZATION OF STATIONARY PHASES FOR LIQUID CHROMATOGRAPHY (IUPAC RECOMMENDATIONS 1997)

Descriptive Terminology

Prepared for publication by

R. M. Smith, Loughborough University, Loughborough, Leicestershire, UK
A. Marton, University of Veszprém, Veszprém, Hungary

© 1997 IUPAC